This listing of claims will replace all prior versions, listings, of claims in the application:

**Listing of Claims**:

1. (currently Amended) A bio-fuel cell system for concurrent production of electrical power and single-cell protein, and consumption of carbon dioxide ($CO_2$), comprising;

~~a) a fuel cell including~~

a cathode compartment containing a cathode electrode with an aqueous solution containing ferric ions ($Fe^{3+}$) being circulated into said cathode compartment with a reaction at the cathode electrode being reduction of ferric ions at the cathode electrode in a reaction given by $4Fe^{3+} + 4e^{-} = 4Fe^{2+}$;

an anode compartment containing an anode electrode;

a first means for injecting ~~with~~ a fuel having a hydrogen constituent ~~being pumped~~ directly into said anode compartment, said anode compartment being separated from said cathode compartment by a membrane permeable to protons, a reaction at the anode electrode being electrochemical oxidation of at least the hydrogen constituent of the fuel to produce electrons ($e^{-}$) and protons ($H^{+}$), wherein protons (H+) formed by the oxidation of hydrogen cross the proton exchange membrane into the cathode compartment; and

~~b)~~ a bioreactor containing chemolithotrophic microorganisms and dissolved nutrients to facilitate growth of the chemolithotrophic microorganisms, ~~a pump for pumping~~ a second means for injecting a fluid containing oxygen ($O_2$) and atmospheric carbon dioxide into the bioreactor, the bioreactor being in flow communication with the cathode compartment so that ~~the~~ an aqueous solution containing ferrous ions ($Fe^{2+}$) and protons ($H^{+}$) is circulated from the cathode compartment to the bioreactor where the ferrous ions ($Fe^{2+}$) are oxidized by the chemolithotrophic microorganisms to ferric ions ($Fe^{3+}$) in an aerobic oxidation reaction given by $4Fe^{2+} + 4H^{+} + O_2 = 4Fe^{3+} + 2H_2O$, ~~wherein electrical power is obtained by making electrical connection between a load and the anode and cathode electrodes, and including~~ and wherein single-cell protein production and carbon dioxide consumption responsively occurs due to fixation of the

carbon dioxide ($CO_2$) by the chemolithotrophic microorganisms in the presence of the dissolved nutrient salts and ferrous ions;

~~a pump for pumping~~ means for circulating a fluid containing said ferric ions ($Fe^{3+}$) into said cathode compartment from said bioreactor; and

wherein electrical power is obtained by making electrical connection between a load and the anode and cathode electrodes.

2. (original) The bio-fuel cell system according to claim 1 wherein the membrane permeable to protons is a proton exchange membrane.

3. (original) The bio-fuel cell system according to claim 1 wherein the membrane permeable to protons is made of a substantially inert material having pores extending therethrough less than about 10 micrometers in diameter.

4. cancelled

5. (currently amended) The bio-fuel cell system according to claim [[4]] 1 wherein the dissolved nutrients is one or more of ammonium sulfate, potassium phosphate, magnesium sulfate, potassium chloride, calcium nitrate, calcium chloride and sulfuric acid.

6. (previously presented) The bio-fuel cell system according to claim 1, wherein the fuel having a hydrogen constituent is selected from the group consisting of hydrogen gas, methanol, methane and ethanol.

7. (previously presented) The bio-fuel cell system according to claim 1, wherein the fuel having a hydrogen constituent is hydrogen gas ($H_2$), and wherein the electrochemical oxidation reaction is oxidation of hydrogen at the anode electrode in a reaction given by $2H_2 = 4H^+ + 4e^-$, and so that an overall bio-fuel cell reaction is given by $2H_2 + O_2 = 2H_2O$.

8. (previously presented) The bio-fuel cell system according to claim 1, wherein the chemolithotrophic microorganisms are *Acidithiobacillus ferroxidans*.

9. (previously presented) The bio-fuel cell system according to claim 1, wherein the chemolithotrophic microorganisms are selected from the group consisting of *Leptospirillum ferrooxidans*, *Acidimicrobium,Alicyclobacillus, and Sulfobacillus*.

10. (previously presented) The bio-fuel cell system according to claim 1, wherein the cathode electrode is made from a chemically inert electrically conducting material.

11. (original) The bio-fuel cell system according to claim 10 wherein the cathode electrode includes a layer of a porous material selected from the group consisting of carbon, nickel and stainless steel.

12. (original) The bio-fuel cell system according to claim 10 wherein the cathode electrode includes a solid plate of a material selected from the group consisting of carbon, nickel and stainless steel.

13. (previously presented) The bio-fuel cell system according to claim 10, wherein the cathode electrode includes a catalyst.

14. (original) The bio-fuel cell system according to claim 13 wherein the catalyst is one of gold, platinum, palladium and lead.

15. (previously presented) The bio-fuel cell system according to claim 1, wherein the bioreactor is a vessel in flow communication with the cathode compartment and enclosing the chemolithotrophic microorganisms, and wherein the aqueous solution containing ferric ions ($Fe^{3+}$) is circulated into said cathode compartment, including a pump for circulating the aqueous solution containing ferrous ions ($Fe^{2+}$) and protons ($H^{+}$) produced in the cathode compartment between the cathode compartment and the bioreactor, where the ferrous ions ($Fe^{2+}$) are oxidized by the chemolithotrophic

microorganisms to ferric ions ($Fe^{3+}$) in said aerobic oxidation reaction, and wherein the ferric ions are recirculated back to the cathode compartment.

16. cancelled

17. (currently amended) The bio-fuel cell system according to claim 16 including ~~voltage control~~ means for applying and controlling a voltage on the cathode electrode for controlling a ratio of electrical production to ~~biomass~~ single-cell protein production by varying microbial cultivation parameters.

18. (currently amended) The bio-fuel cell system according to claim 16 including ~~reagent control~~ means for controlling a ratio of $Fe^{2+}/Fe^{3+}$ concentrations for varying microbial cultivation parameters in order to control a ratio of electrical production to ~~biomass~~ single-cell protein production.

19. (currently amended) The bio-fuel cell system according to claim 4 including ~~reagent control~~ means for controlling concentrations of the dissolved nutrients concentrations for varying microbial cultivation parameters in order to control a ratio of electrical production to ~~biomass~~ single-cell protein production.